

Bissel Creek Subbasin Assessment and Total Maximum Daily Load



Department of Environmental Quality

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Appendix A. Unit Conversion Chart

Metric - English unit conversions.

	English Units	Metric Units	To Convert	Example
Distance	Miles (mi)	Kilometers (km)	1 mi = 1.61 km 1 km = 0.62 mi	3 mi = 4.83 km 3 km = 1.86 mi
Length	Inches (in) Feet (ft)	Centimeters (cm) Meters (m)	1 in = 2.54 cm 1 cm = 0.39 in 1 ft = 0.30 m 1 m = 3.28 ft	3 in = 7.62 cm 3 cm = 1.18 in 3 ft = 0.91 m 3 m = 9.84 ft
Area	Acres (ac) Square Feet (ft ²) Square Miles (mi ²)	Hectares (ha) Square Meters (m ²) Square Kilometers (km ²)	1 ac = 0.40 ha 1 ha = 2.47 ac 1 ft ² = 0.09 m ² 1 m ² = 10.76 ft ² 1 mi ² = 2.59 km ² 1 km ² = 0.39 mi ²	3 ac = 1.20 ha 3 ha = 7.41 ac 3 ft ² = 0.28 m ² 3 m ² = 32.29 ft ² 3 mi ² = 7.77 km ² 3 km ² = 1.16 mi ²
Volume	Gallons (g) Cubic Feet (ft ³)	Liters (L) Cubic Meters (m ³)	1 g = 3.78 l 1 l = 0.26 g 1 ft ³ = 0.03 m ³ 1 m ³ = 35.32 ft ³	3 g = 11.35 l 3 l = 0.79 g 3 ft ³ = 0.09 m ³ 3 m ³ = 105.94 ft ³
Flow Rate	Cubic Feet per Second (ft ³ /sec) ¹	Cubic Meters per Second (m ³ /sec)	1 ft ³ /sec = 0.03 m ³ /sec 1 m ³ /sec = ft ³ /sec	3 ft ³ /sec = 0.09 m ³ /sec 3 m ³ /sec = 105.94 ft ³ /sec
Concentration	Parts per Million (ppm)	Milligrams per Liter (mg/L)	1 ppm = 1 mg/L ²	3 ppm = 3 mg/L
Weight	Pounds (lbs)	Kilograms (kg)	1 lb = 0.45 kg 1 kg = 2.20 lbs	3 lb = 1.36 kg 3 kg = 6.61 kg

¹ 1 ft³/sec = 0.65 million gallons per day; 1 million gallons per day is equal to 1.55 ft³/sec.² The ratio of 1 ppm = 1 mg/L is approximate and is only accurate for water.

Appendix B. State and Site-Specific Standards and Criteria

- The *Idaho Water Quality Standards and Wastewater Treatment Requirements* are available on the web at <http://www2.state.id.us/adm/adminrules/rules/idapa58/0102.pdf>.
- No site specific criteria were used in developing the Bissel Creek TMDL
- Table B-1 outlines the water quality standards used in the Bissel Creek Subbasin Assessment and TMDL.

Table B-1. Idaho water quality standards uses in the Bissel Creek Subbasin Assessment and TMDL.

Pollutant	Applicable Water Quality Standard
Sediment (58.01.02.200.08)	Sediment shall not exceed quantities specified in general surface water quality criteria (IDAPA 58.01.02.250 or 252) or, in the absence of specific sediment criteria, quantities which impair designated beneficial uses
Bacteria (58.01.02.251.01.b,c)	Less than 126 <i>E. coli</i> organisms/100 mL as a 30 day geometric mean with a minimum of five samples AND no sample greater than 406 <i>E. coli</i> organisms/100 mL

Appendix C. Photo Documentation of Intermittence for Segments of Bissel Creek

The state of Idaho defines an intermittent stream as one that has a period of zero flow for at least one week during most years or has a 7Q2 hydrologically-based flow of less than 0.10 cfs (IDAPA 58.01.02.003.51). If a stream contains naturally perennial pools containing significant aquatic life, it is not considered intermittent.

The intent of this photo evaluation is to use the available data to show that Bissel Creek is intermittent from river mile 13.4 to the North Side Canal. Ideally, a calculation of the 7Q2 in combination with field notes and photographs would be used to determine the intermittence of a stream. Unfortunately, insufficient flow data exists to calculate the 7Q2. Given the lack of flow data to calculate the 7Q2, two lines of evidence are used for the evaluation: 1) instantaneous flow measurements collected as part of BURP and 2) time-dated site photographs. These lines of evidence provide sufficient data to determine whether periods of zero-flow exist.

The water quality standards (IDAPA 58.01.02.070.07) state that water quality standards shall only apply to intermittent waters during optimum flow periods sufficient enough to support the beneficial uses for which the water body has been designated. The optimum flow for contact recreation is equal to or greater than 5.0 cfs. The optimum flow for aquatic life is equal to or greater than 1.0 cfs.

The implication of this rule is that a TMDL for the intermittent portion of Bissel Creek is not appropriate unless it is shown that a *pollutant* impairs aquatic life when flows exceed 1.0 cfs. The hydrology of most intermittent streams is such that the time of year when flows exceed 1.0 cfs corresponds with spring runoff. Determining beneficial use support status during the runoff period typically yields false determinations of pollutant-caused impairment. These false determinations occur because the biotic community in the stream is limited by high velocity flushing flows as runoff occurs and then by a shortage of time to establish a fully functioning community before the stream goes dry. Thus, the aquatic life community is limited by hydrological conditions, not pollutants.

Analysis of Flow

Bissel Creek extends for a length of 15.3 miles from its headwaters to where it enters the Payette River. Flow data from June 1995, August 1996 and June 1998 all show a flow of 0 in the segment from below river mile 13.4 to the North Side Canal. The following pictures photo document the lack of water between river mile 13.4 and the North Side Canal in July 2000 (Ferguson 2000). Figure C-1 shows the location of each photo.

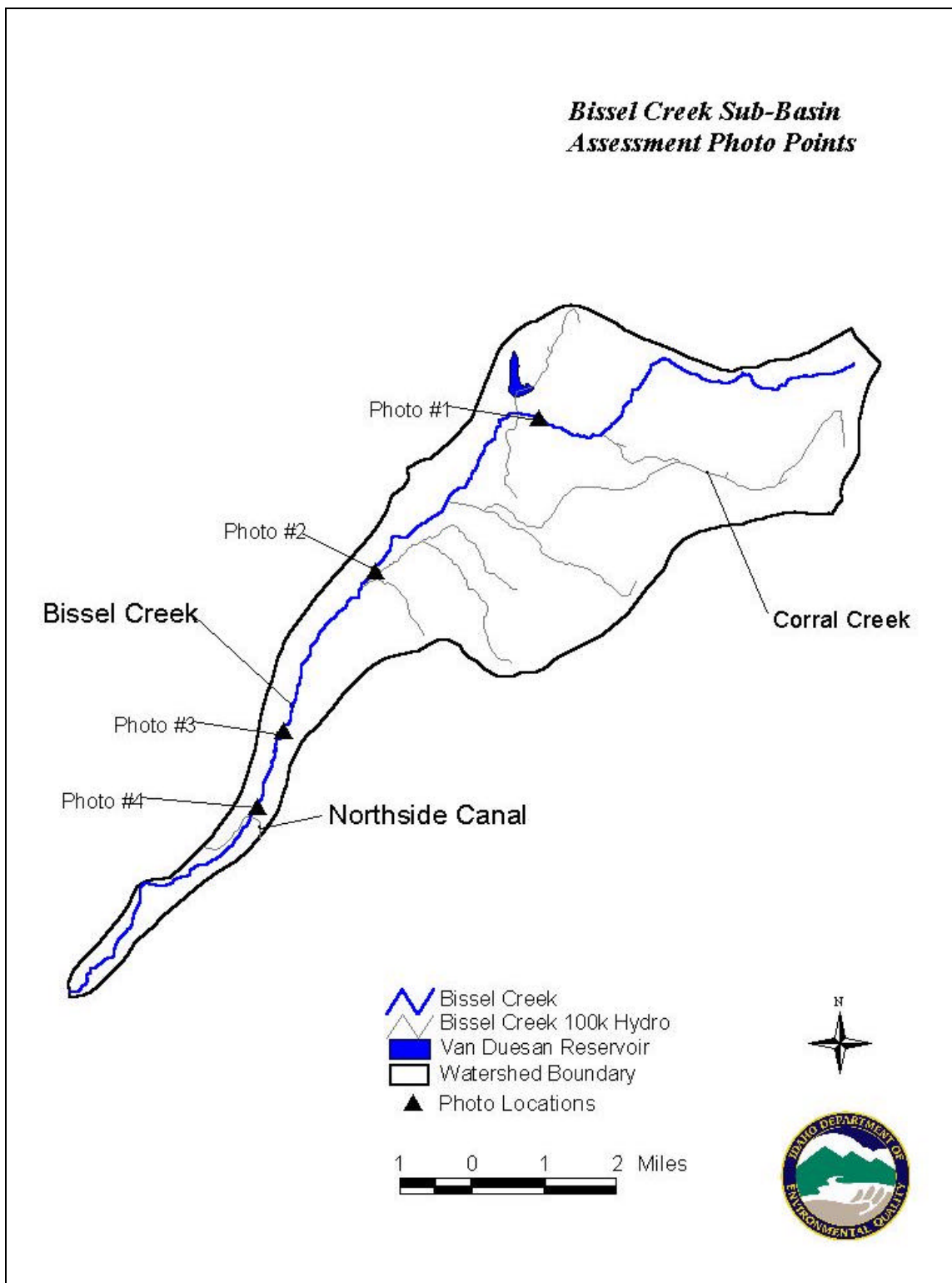


Figure C-1. Location of Photos



Photo #1



Photo #2



Photo #3



Photo #4

The lack of documented flow (as described above) in Bissel Creek shows that in a normal water year extended periods of zero flow occur from river mile 13.4 to the North Side Canal. As such, this segment of Bissel Creek is considered intermittent and the pollutant standards outlined in the *Idaho Water Quality Standards and Wastewater Treatment Requirements* apply only during base flow periods when flows exceed 1.0 cfs. These periods have not been documented.

Appendix D. Data Sources

Table C-1 Data sources for Bissel Creek Subbasin Assessment and TMDL

Location	Data Source¹	Types of Data	When Collected
Headwaters	DEQ, ISCC	Physical, Chemical	2000
BC-4	IDA	Physical, Chemical, Biological	1999
BC-3	IDA	Physical, Chemical, Biological	1999
BC-2	IDA, DEQ	Physical, Chemical, Biological	1999, 2001
BC-1	IDA	Physical, Chemical, Biological	1996, 1999

¹DEQ = Department of Environmental Quality, IDA = Idaho Department of Agriculture, ISCC = Idaho Soil Conservation Commission

Table C-2. Data tiers¹ for data used in the Bissel Creek TMDL

Location	Data Source	Data Tier	Outcome
Headwaters	DEQ, ISCC	1	No impairment
BC-4	IDA	1	A sediment and bacteria TMDL has been prepared below the North Side Canal
BC-3	IDA	1	A sediment and bacteria TMDL has been prepared below the North Side Canal
BC-2	IDA, DEQ	1	A sediment and bacteria TMDL has been prepared below the North Side Canal
BC-1	IDA	1	A sediment and bacteria TMDL has been prepared below the North Side Canal

¹Based on IDEQ Water Body Assessment Guidance definitions of Tier 1-Tier 3 data (Grafe et. al. 2002)

Appendix E. Periphyton Analysis for Bissel Creek, Dr. Loren Bahls.

The following paragraphs are an excerpt for the report entitled *Support of aquatic life uses in streams in southwest Idaho in 2000 based on the composition and structure of the benthic algae community* (Bahls 2001).

Soft Algae. The one periphyton sample from Bissel Creek was dominated by the filamentous green alga *Oedogonium*. This alga is common in low-gradient streams. *Mougeotia*, another filamentous green, ranked second, and diatoms ranked third in biomass. Cyanobacteria (*Oscillatoria*) were also present. A total of 8 genera of non-diatom algae were observed in the sample from Bissel Creek, which is a typical number for mountain streams.

Diatoms. The dominant diatom species in Bissel Creek was *Rhoicosphenia curvata*, which accounted for 42% of the diatoms in this sample. *Rhoicosphenia curvata* is an epiphytic diatom and its abundance in Bissel Creek may be explained by an abundance of filamentous green algae, which serve as attachment sites. *Cocconeis placentula*, another epiphytic diatom, was also common in Bissel Creek. Other than minor impairment due to a large percentage of *Rhoicosphenia curvata*, Bissel Creek had excellent biological integrity and fully supported its aquatic life uses.

The siltation index for Bissel Creek approached but did not cross the threshold for minor impairment. A large number of *Achnanthes lanceolata* also indicated some sedimentation here. *A. lanceolata* is an attached diatom that prefers sand grains as attachment sites. Bissel Creek had healthy diatom diversity and species richness, no abnormal cells, and no diatoms in the family Epithemiaceae. The pollution index was a bit low for a mountain stream, but still within the range of excellent biological integrity and no impairment.

Appendix F. Macroinvertebrate Biological Integrity Report

**Bissel Creek (HUC 17050122)
Gem County, Idaho**

Macroinvertebrate Biotic Integrity Report

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ABSTRACT

The macroinvertebrates of Bissel Creek (HUC 17050122) in Gem County, Idaho, were sampled as part of the Lower Payette Total Maximum Daily Load (TMDL) project by the Idaho Department of Environmental Quality during summer 1998. Previous visits during 1995 and 1996 found the stream dry. The objective was to assess fine sediment impacts on the macroinvertebrate aquatic life in this area.

A preliminary look at the macroinvertebrate data from this site indicates a good taxa richness. Upon examination of the taxa present, however, we find that they are predominantly pollution tolerant taxa. The sample showed poor Ephemeroptera, Plecoptera, Trichoptera (EPT) richness. The EPT present are the pollutant tolerant species/groups. No Plecoptera were found at the site which indicates pollution problems and probable fine sediment impacts. The few taxa of Ephemeroptera and Trichoptera are composed of the more pollution tolerant groups. It appears that the taxa sensitive to fine sediment pollution are no longer found at these sites. This is probably due to a combination of the habitat present and the impacts of fine suspended sediment.

The site is very low in the scraper functional feeding group and very high in the collector gatherer feeding group. This again indicates an area dominated by fine sediment.

I recommend increasing the sample size by adding “above and below” and reference sites if possible. I recommend examination and comparison of the macroinvertebrate data to the periphyton data collected for a more complete analysis of potential sediment impacts at these stream sites. It is difficult to separate the impacts of fine sediment, high water temperature, and poor macroinvertebrate habitat.

INTRODUCTION

Macroinvertebrates of Bissel Creek, Gem County, Idaho, 303(d) listed streams (Idaho Division of Environmental Quality 1999) were sampled as part of the Lower Payette total maximum daily load (TMDL) project by the IDEQ Boise Regional Office. The sample site is located just northwest of Emmett.

Bissel Creek (Headwaters to Payette River, 16.99 river miles) in HUC 17050122 was listed on the 1998 303(d) list (Idaho Division of Environmental Quality 1999)(Table 1). The stream was listed for sediment as pollutant. This report provides findings from an analysis of macroinvertebrate data on these streams in an attempt to determine if the pollutant responsible for the 303(d) listing is fine sediment.

Previous studies of macroinvertebrates and water quality issues in this area include Robinson and Minshall (1994).

Table 1. Site visits for Bissel Creek (HUC 17050122). Stream sites and dates visited are given. The pollutant(s) as listed in the 1998 303(d) list (IDEQ 1999) is sediment. All sites are located in the Shake River Basin/High Desert Ecoregion.

<u>STREAM</u>	<u>SITE</u>	<u>DATE</u>	<u>SITE ID</u>	<u>CONDITION</u>
Bissel Creek	Just bl powerline	06-22-1995	95SWIROB57	Dry
Bissel Creek	@ canal crossing	08-06-1996	96SWIROA75	Dry
Bissel Creek	@ canal crossing	06-29-1998	1998SBOIB020	Dry
Bissel Creek	Bl old Black Canyon Hwy	06-29-2001	TMDL-BC-001-JUN	Flowing water present

MATERIALS AND METHODS

Study Area

The study area is in USGS cataloging unit (HUC) 17050122 in the Emmett area, Gem County, Idaho. Early sampling attempts to collect macroinvertebrates encountered a dry channel. In 2001 the sampling crew traveled about two miles further downstream where there was water present. The majority of the area consists of rangeland administered by the Bureau of Land Management at the higher reaches. Private land is found in the lower area. All sites are located in the Snake River Basin/High Desert Ecoregion (Omernik and Gallant 1986). Four stream sites were visited and in this macroinvertebrate biotic integrity report for this project (Table 1).

Sample Site Descriptions

The 1995 site was visited just below where the powerline crosses Bissel Creek. The 1996 and 1998 sites were at the canal crossing of Bissel Creek. By summer the stream is usually dewatered at this point. The 2001 sample site was moved a couple of miles down stream where the stream still had water. The streambed consists of gravel/cobble bottom substrate.

Field Methods

Macroinvertebrate sample methods follow Clark and Maret (1993) and Idaho Division of Environmental Quality beneficial use reconnaissance project (Beneficial Use Reconnaissance Project Technical Advisory Committee 1999). Three Hess samples were taken and combined for each of three separate riffles. Macroinvertebrates were processed by EcoAnalysts, Inc. of Moscow, Idaho. Voucher specimens of the macroinvertebrates will be deposited in the Orma J. Smith Museum of Natural History, Albertson College of Idaho, Caldwell.

Methods of Analysis

The macroinvertebrate sample metrics were interpreted consistent with current literature. Hafele and Hinton (1996), Oregon Watershed Enhancement Board (1999), Relyea (1999), Relyea et al. (2000), PEERS (1998), and Wisseman (1996) were especially helpful in determining the tolerance of the invertebrates collected to fine sediment.

Invertebrate taxa found during this study can be compared to information from southern Idaho (Robinson and Minshall 1994). Our knowledge of these invertebrate groups and the techniques used in making the identifications have improved in recent years and the resulting determinations are for the most part, done to a finer level.

The macroinvertebrate metrics currently used by this report to examine the sample data include: percent Ephemeroptera, Plecoptera, and Trichoptera (EPT), percent scrapers, EPT index, taxa richness and pollution tolerance. The metrics examined can be separated into four categories: richness, composition, tolerance, and trophic/habitat.

Richness (or community structure)

Taxa richness reflects the health of the assemblage through a measure of the variety of taxa (total number of distinct genera or species) present. Taxa richness can be equated to biodiversity. Taxa richness generally increases with increasing water quality, habitat diversity, or habitat suitability. Barbour and others (1992) and Karr and Chu (1999) report that taxa richness is a reliable indicator of human influence in the Pacific Northwest and will generally decrease with an increase in such influence. The EPT index is a metric that summarizes the taxa richness of these three orders of insects that are generally considered to be sensitive to pollution (including temperature and fine sediment).

Barbour et al. (1999) report that EPT Index is a reliable indicator of human influence in the Pacific Northwest and will generally decrease with an increase in such influence. It follows then that the number of Ephemeroptera taxa and the number of Plecoptera taxa will likewise be good indicators of temperature and fine sediment pollution. It is sometimes helpful to look at these taxa separately although they are considered in the two previously mentioned metrics. Karr and Chu (1999) show that these three metrics are reliable indicators of human influence across the Pacific Northwest, including central Idaho. Another way to measure diversity is with Shannon's H' diversity index. This metric is based on the observation that relatively undisturbed environments support communities having great taxa richness with no individual species present in overwhelming abundance. It has been one of the most popular diversity indices used for water quality assessment.

Robinson and Minshall (1994) found that species richness and EPT richness were two of six community level metrics found important for the Snake River Plains Ecoregion. Robinson and Minshall (1994) also found that the values for both of these metrics were usually higher in upland stream sites in comparison with lowland sites.

Composition

Percent EPT increases as water quality increases, since these groups generally contain taxa that are considered more sensitive to temperature and fine sediment pollution. Karr and Chu (1999) show that these taxa decreased with increased human influence in the Pacific Northwest. They show the same relationship between intolerant taxa (which include EPT). It likewise follows, that each of the EPT groups examined separately (percent Ephemeroptera, percent Plecoptera, and percent Trichoptera) will also show the same trend in relation to temperature and fine sediment pollution. It may be useful to examine these metrics separately at times. Total Abundance of macroinvertebrate organisms in a sample can also serve as an indicator of stream health. Generally greater total abundance will indicate a stream of decreased impact and increased water quality. There comes a point (this is dependent on the particular stream, impacts, and taxa present) where larger Total Abundance indicates a decrease in water quality. This condition is evident when pollution (which includes temperature and fine sediment) has reduced or eliminated the sensitive species and the remaining tolerant species thrive with the resulting reduced competition.

Trophic/Habitat

Percent scrapers uses the functional feeding group approach to assessment. The relative abundance of scrapers provides an indication of the riffle community food base (periphyton or primary production composition). Scrapers increase with increased abundance of diatoms and decrease as filamentous algae and aquatic mosses increase. Scrapers decrease in relative abundance following increases in fine particle sedimentation in coarse particle substrate stream beds. Percent scrapers has been shown to be sensitive to human influence in Central Idaho (Karr and Chu 1999).

Collectors and collector gatherers groups are well known groups found inhabiting this soft substrate (Voshell 2002). These organisms would be expected to increase with increased fine sediment.

Pollution tolerance

Pollution tolerance is a value placed on the various macroinvertebrate taxa from 0 to 11. A 0 or low number would indicate a very low pollution tolerance. This means that the taxa would be very sensitive to pollution. A higher number indicates that the taxa have a high pollution tolerance and would be very tolerant of pollution. A value of 11 means the pollution tolerance is unknown. These values have come from a variety of sources including Hilsenhoff (1987), Relyea (1999), Wisseman (1996), and others, and are used in the DEQ database.

A preliminary list of cold water indicator macroinvertebrates is given in Clark (1997). This preliminary list gives the known cold water indicator taxa for Idaho along with appropriated literature references.

RESULTS AND DISCUSSION

Macroinvertebrates collected at Bissel Creek in June 2001 are given in Table 2. The data show a macroinvertebrate assemblage expected in a stream polluted by sediment.

Richness (or community structure)

A preliminary look at the macroinvertebrate data from this site indicates a good taxa richness (n=35)(Table 2). Upon examination of the taxa present, however, we find that they are predominantly pollution tolerant taxa. The sample showed poor Ephemeroptera, Plecoptera, Trichoptera (EPT) richness. The EPT present are the pollutant tolerant species/groups. No Plecoptera were found at the site which indicates pollution problems and probable fine sediment impacts. The few taxa of Ephemeroptera (n=3) and Trichoptera (n=4) are composed of the more pollution tolerant groups. It appears that the taxa sensitive to fine sediment pollution are no longer found at these sites. This is probably due to a combination of the habitat present and the impacts of fine suspended sediment.

Composition

Percent EPT increases as water quality increases and thus decreases as water quality decreases, since these groups generally contain taxa that are considered more sensitive to fine sediment pollution. Certainly the percent EPT is low in Bissel Creek (Ephemeroptera, 3 taxa, Trichoptera, 4 taxa, and no Plecoptera). There are no reference cites and no other sites on Bissel Creek to compare these data to. Karr and Chu (1999) show that these taxa decreased with increased human influence in the Pacific Northwest.

Trophic/Habitat

Percent scrapers is a measure of the trophic and habitat condition of a stream and uses the functional feeding group approach to assessment. Since there were only three scraper taxa found in the Bissel Creek sample (approximately 8% of the total taxa present)(Table 2). This low percentage of the scraper feeding group is an indication of a low periphyton or primary producer assemblage in the riffle habitat. This is thus a good indicator of fine particle sedimentation. Karr and Chu (1999) have shown that the percent scrapers metric is sensitive to human influence in Central Idaho.

The majority of the taxa (57%) are collectors (Table 2). The implication is that the system is high in particulate matter which would be expected in a stream with high sediment composition. The midge (Chironomidae) and worm (Oligochaeta) groups are dominant in the collector gatherer functional feeding group. These are well known groups found inhabiting this soft substrate (Voshell 2002).

Pollution tolerance

The pollution tolerance of the macroinvertebrates collected on Bissel Creek is given in Table 2. The tolerance is high (mean 6.6, n=35). The tolerance values range from a central value of five for some insects (*Cardiocladius* and *Dicranota*, and *Glossosoma*) to a very high value of nine for some non-insects (the amphipod, *Hyaella* and the oligochaete worm, *Enchytraeidae*)(Table 2). As mentioned earlier, the Ephemeroptera and Trichoptera found were also of the more pollution tolerant taxa. The three mayflies (*Baetis tricaudatus*, *Tricorythodes* sp., and *Attenella margarita*) have a mean tolerance value of over seven (Table 2). The four caddisfly taxa (*Hydropsyche* sp., *Cheumatopsyche* sp., *Glossosoma* sp., and *Hydroptila* sp.) have a mean tolerance value of nearly seven (Table 2). The high tolerance values reported for these taxa indicate that fine sediment pollution is a problem at this site.

No cold water indicator taxa were found at this site (Table 2). The warm water indicator taxa found at the site (Table 2) also indicate tolerance to fine sediment.

CONCLUSIONS AND RECOMMENDATIONS

1. I recommend examination and comparison of the macroinvertebrate data to the periphyton data collected for a more complete analysis of potential sediment impacts at these stream sites.
2. I recommend increasing the sample size in the future as it is very difficult to make positive recommendations on a single sample. Both “above and below” samples as well as samples from reference sites would be valuable for comparison.
3. It is difficult to separate the impacts of fine sediment, high water temperature, and poor macroinvertebrate habitat. Considering the data from this single sample I believe that fine sediment is the primary pollutant of concern.

ACKNOWLEDGMENTS

EcoAnalysts, Inc. (Gary Lester) provided the macroinvertebrate identifications of the samples presented here. The Boise IDEQ Regional Office (Mike Ingham) took the field samples. Mike Ingham provided valuable information concerning the sample and samples sites and the project in general. Christina Relyea kindly provided literature on sediment impacts on aquatic invertebrates. Mark Shumar assisted with Table 2, data processing, and provided peer review of this document.

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Table 2. Macroinvertebrates collected at Bissel Creek, June 2001, along with water quality related attributes.

Name	Class	Order	Family	Genus	Species	Feeding Group	Temp. Tolerance	Tolerance Value
Nematoda		Nematoda (phylum)				Omnivore	Euryth: warm	6
Pisidium sp.	Bivalvia	Bivalvia (class)	Sphaeriidae	Pisidium	sp.	Collector Filterers	Euryth: hot	5
Acari	Arachnida	Acari (subclass)				Parasites	Euryth: warm	6
Hyaella sp.	Crustacea	Amphipoda	Talitridae	Hyaella	sp.			9
Crangonyx sp.	Crustacea	Amphipoda	Crangonyctidae	Crangonyx	sp.	Collector Gatherers	Euryth: cool	7
Dicranota sp.	Insecta	Diptera	Tipulidae	Dicranota	sp.	Engulfer Predators	Euryth: warm	5
Chelifera sp.	Insecta	Diptera	Empididae	Chelifera	sp.	Engulfer Predators	Euryth: warm	6
Optioservus sp.	Insecta	Coleoptera	Elmidae	Optioservus	sp.	Scrapers (grazers)	Euryth: warm	7
Baetis tricaudatus	Insecta	Ephemeroptera	Baetidae	Baetis	tricaudatus	Scrapers (grazers)	Euryth: warm	7
Tricorythodes sp.	Insecta	Ephemeroptera	Tricorythidae	Tricorythodes	sp.	Collector Filterers		8
Attenella margarita	Insecta	Ephemeroptera	Ephemerellidae	Attenella	margarita	Collector Gatherers	Euryth: warm	7
Hydropsyche sp.	Insecta	Trichoptera	Hydropsychidae	Hydropsyche	sp.	Collector Filterers		6
Cheumatopsyche sp.	Insecta	Trichoptera	Hydropsychidae	Cheumatopsyche	sp.	Collector Filterers	Euryth: warm	8
Glossosoma sp.	Insecta	Trichoptera	Glossosomatidae	Glossosoma	sp.	Scrapers (grazers)	Euryth: cool	5

Hydroptila sp.	Insecta	Trichoptera	Hydroptilidae	Hydroptila	sp.	Piercer Herbivore	Euryth: warm	8
Orthocladius sp.	Insecta	Chironomidae (family)	Chironomidae	Orthocladius	sp.	Collector Gatherers	Euryth: warm	6
Cricotopus trifascia gr.	Insecta	Chironomidae (family)	Chironomidae	Cricotopus	trifascia	Detritus Shredders	Euryth: warm	6

Name	Class	Order	Family	Genus	Species	Feeding Group	Temp. Tolerance	Tolerance Value
Cricotopus sp.	Insecta	Chironomidae (family)	Chironomidae	Cricotopus	sp.	Detritus Shredders	Euryth: warm	7
Cricotopus bicinctus gr.	Insecta	Chironomidae (family)	Chironomidae	Cricotopus	bicinctus	Detritus Shredders	Euryth: warm	7
Cardiocladius sp.	Insecta	Chironomidae (family)	Chironomidae	Cardiocladius	sp.	Engulfer Predators	Euryth: warm	5
Eukiefferiella brevicar gr.	Insecta	Chironomidae (family)	Chironomidae	Eukiefferiella	brevicalcar	Collector Gatherers	Euryth: cool	4
Eukiefferiella claripennis gr.	Insecta	Chironomidae (family)	Chironomidae	Eukiefferiella	claripennis	Collector Gatherers	Euryth: warm	8
Phaenopsectra sp.	Insecta	Chironomidae (family)	Chironomidae	Phaenopsectra	sp.	Collector Gatherers	Euryth: warm	7
Polypedilum sp.	Insecta	Chironomidae (family)	Chironomidae	Polypedilum	sp.	Collector Gatherers	Euryth: warm	6
Tanytarsus sp.	Insecta	Chironomidae (family)	Chironomidae	Tanytarsus	sp.	Collector Gatherers	Euryth: warm	8
Micropsectra sp.	Insecta	Chironomidae (family)	Chironomidae	Micropsectra	sp.	Collector Gatherers	Euryth: warm	7
Rheotanytarsus sp.	Insecta	Chironomidae (family)	Chironomidae	Rheotanytarsus	sp.	Collector Gatherers	Euryth: warm	6
Thienemannimy	Insecta	Chironomidae	Chironomidae	Thienemannim		Engulfer	Euryth:	6

ia gr. sp.		ae (family)	e	yia		Predators	warm	
Enchytraeidae	Oligochaeta	Oligochaeta (class)	Enchytraeidae			Collector Gatherers		9
Nais barbata	Oligochaeta	Oligochaeta (class)	Naididae	Nais	barbata	Collector Gatherers		8
Nais behningi	Oligochaeta	Oligochaeta (class)	Naididae	Nais	behningi	Collector Gatherers		8
Nais variabilis	Oligochaeta	Oligochaeta (class)	Naididae	Nais	variabilis	Collector Gatherers		8
Pristina leidyi	Oligochaeta	Oligochaeta (class)	Naididae	Pristina	leidyi			8
Pristinella jenkiniae	Oligochaeta	Oligochaeta (class)	Naididae	Pristinella	jenkiniae	Collector Gatherers		8
Tubificidae w/o cap setae	Oligochaeta	Oligochaeta (class)	Tubificidae			Collector Gatherers		8

Appendix G. Distribution List

TRACY CHELLIS
U.S. EPA REGION 10
SEATTLE WA 98101

LEVI MONTOYA
NRCS
1805 HWY 16 ROOM 1
EMMETT ID 83617

DAR OLBERDING
5454 W CENTER ROAD
EMMETT ID 83617

DIST 65 WATER MASTER
102 NORTH MAIN ST
PAYETTE ID 83661

CLAUDE BRUCE
PAYETTE SWCD
10550 HWY 95
PAYETTE ID 83661

TOM PENCE
5433 BIG WILLOW RD
PAYETTE ID 83661

DEAN CHARTERS
LAST CHANCE IRRIGATION
1507 JORDAN LANE
EMMETT ID 83617

DENNIS DICKINSON
PO BOX 1010
FRUITLAND ID 83619

GEORGE MCCLELLAND
1905 NW 1ST AVE
FRUITLAND ID 83619

KARL SILLER
EMMETT IRRIGATION DIST
1945 JACKSON AVE
EMMETT ID 83617

KATHY SKIPPEN
454 W CENTRAL
EMMETT ID 83617

KIRK VICKERY
GEM SWCD
2379 MESA AVE
EMMETT ID 83617

KIRK CAMPBELL
DEPT OF AG
2270 OLD PENITENTIARY RD
BOISE ID 83701

TOM HOPPELL
501 E MAIN ST
EMMETT ID 83617

MIKE RAYMOND
NRCS
1630 3RD STREET
PAYETTE, ID 83661

RICK SCHULTZ
FRUITLAND WASTEWATER
PO BOX 324
FRUITLAND ID 83619

Appendix H. Public Comments

This appendix documents the comments received during the 43-day comment period for the Bissel Creek Subbasin Assessment and Total Maximum Daily Load. The originally scheduled comment period extended from June 27, 2003 to July 25, 2003. However, the Lower Payette Watershed Advisory Group requested an extension and the comment period was extended to August 8, 2003. The comments received as well as DEQ's responses to the comments are documented in the following matrix. In some instances the comment is summarized. In others, the exact comment is given.

Comments From: Dean Heideman Received via mail: July 11, 2003	DEQ Response:
<p>1) "I am quite pleased to see at long last, something is to be done about Bissel Creek."</p> <p>2) "However, I would like to draw your attention to two other drain ditches in my area, both are irrigation drain ditches. One is between Beacon and Big Four on West Idaho Blvd. It carries a large amount of sediment from the fields above. Most of the farmland that drains into this system is of hilly nature, so there is a lot of erosion in the fields until crops cover and root. The erosion problem is made even worse by the fact that the Emmett Irrigation District allows farmers to move water from field to field allowing them to apply lots of water in a short time. This is causing even more washing of the topsoil from the fields along with over loading smaller waste ditches that drain into the main stream to wash and erode from the bottom and sides, sending more sediment into the river. This drain also has a small feedlot on its bank. Even under the best of conditions some of this animal waste is going to make its way into the drain and then into the river. This is made especially bad during the wet snows of winter and heavy rains of spring as the elevation of the feedlot is downhill into the drain system."</p> <p>"The second drain is between Big Four and Mesa. This drain suffers the same problems as the first, but is carrying more water as it drains a larger amount of farmland."</p> <p>3) "Although some of the farmers have installed some small sediment ponds for the most part they are too small for the amount of sediment and return water that runs through them, and are not kept dredged out so my mid summer they are full of sediment and no longer effective."</p>	<p>Comment noted.</p> <p>This drain is beyond the scope the Bissel Creek TMDL. However, DEQ appreciates being made aware of potential sources of pollutants to the Payette River. We are forwarding your concern to the Soil Conservation Commission and the Natural Resource Conservation Service for their consideration. These two agencies would be able to assist landowners with conservation plans to reduce erosion.</p> <p>This drain is beyond the scope the Bissel Creek TMDL. However, DEQ appreciates being made aware of potential sources of pollutants to the Payette River.</p> <p>The local soil conservation district has resources available to assist landowners in these matters.</p>

Comments From: Dar Olberding Emmett Irrigation District, Chairman Received via fax: August 8, 2003	DEQ Response:
<p>1) "The board would like to thank you for attending our meeting Tuesday night." (August 5, 2003) Your presentation was informative and helped explain the process and implications of the TMDL. We also appreciate DEQ extending the comment period through Friday, August 8."</p> <p>2) "Emmett Irrigation District would like to express concerns as to whether a TMDL is necessary. In our opinion, Bissel Creek is and should be considered an intermittent stream. Periodically above Big 4 Avenue, the stream dries up and remains dry until spring runoff."</p> <p>3) "Also at issue is the fact regarding test results. The TMDL was prepared rather quickly and whether enough data has been collected to make the case is questionable at best."</p> <p>4) "The board respectfully requests that more testing be done to support the necessity of placing a TMDL on Bissel Creek."</p>	<p>Comment noted.</p> <p>The flow data presented in the Subbasin Assessment shows that Bissel Creek at Big 4 Avenue contains water in all months of the year. DEQ agrees that periodically the stream goes dry above Big 4 Avenue. However, in April and May this segment discharges sediment and bacteria to the lower segments. As such, a TMDL is required for the segment.</p> <p>DEQ agrees that the TMDL was quickly prepared. This was because the necessary biological data had only recently become available. However, the Subbasin Assessment shows quite conclusively that during a typical irrigation season, the total suspended solids and bacteria levels in Bissel Creek exceed the water quality standards. The poor biological communities substantiate this data.</p> <p>DEQ is legally compelled to prepare a TMDL at this time. However, as noted in Table 11 of the Subbasin Assessment, DEQ agrees that additional data collection is necessary to fill critical data gaps. The additional steps to fill these data gaps will be outlined in the TMDL implementation plan.</p>
Comments From: Tracy Chellis Environmental Protection Agency, Office of Water, Watershed Restoration Unit Received via e-mail: August 8, 2003	DEQ Response:
<p>1) Page xii - Table A: The "Recommended Changes to the §303(d) List" column notes that no changes are being suggested, however in the Subbasin Assessment-Watershed Characterization section it is being recommended that Bissel Creek from the Headwaters to North Side Canal be delisted.</p> <p>2) Page 29 - Nonpoint Sources and Table 12: Are there currently any BMPs in effect in the Bissel Creek watershed or planned for the near future? If there are, please provide any details on the effect</p>	<p>DEQ is proposing to delist sediment from the headwaters to the North Side Canal and list bacteria from the North Side Canal to the Payette River. This discrepancy will be corrected in the final document.</p> <p>DEQ with the assistance of the Soil Conservation Commission will attempt to determine the extent of existing or planned BMPs in the Bissel Creek subwatershed. Where applicable, this information</p>

<p>that they have had on any of the water quality problems.</p> <p>3) Page 35 - Margin of Safety: Please provide more discussion about how the 5% Margin of Safety for Sediment was arrived at or cite the specific page in the Succor Creek TMDL where it can be found.</p> <p>4) Page 37 - Table 15: In a watershed that has excess sediment and where a total load reduction is necessary it may appear misleading that one compliance point would be allowed an increase in the typical existing sediment load. While the data for 1999 (Table 4) show that the average TSS is 20.7, Table 11 suggests that there are data gaps for SSC and TSS. Perhaps you could include more discussion about how this increase will still allow for a decrease in sediment to the system and that if in the implementation of the TMDL it is found that these allocations are not allowing the watershed to meet water quality standards they could be changed.</p>	<p>will be included in the final document.</p> <p>Additional discussion will be added to the “Margin of Safety” section of the TMDL to further describe how the MOS was derived.</p> <p>Table 15 will be modified so that it does not appear as if an increase in sediment is acceptable between BC-2 and BC-3.</p> <p>Regarding the listing of TSS and SSC as a data gap in Table 11, the table defines the gap as “multiple years data.” While there is certainly enough TSS data to develop a TMDL, DEQ would prefer to have data from multiple years to better define the temporal conditions.</p>
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